SYSTEM AND METHOD FOR MINIMIZING INCREASES IN VIA RESISTANCE BY APPLYING A NITROGEN PLASMA AFTER A TITANIUM LINER DEPOSITION

ABSTRACT OF THE DISCLOSURE

A system and method is disclosed for minimizing increases in via resistance by applying a nitrogen plasma after a titanium liner deposition. A via in a semiconductor device is formed by placing a metal layer on a substrate and placing a layer of anti-reflective coating (ARC) titanium nitride (TiN) over the metal layer. A layer of dielectric material is placed over the ARC TiN layer and a via passage is etched through the dielectric and partially through the ARC TiN layer. A titanium layer is then deposited and subjected to a nitrogen plasma process. The nitrogen plasma converts the titanium layer to a first layer of titanium nitride. The first layer of titanium nitride does not react with fluorine to form a high resistance compound. Therefore the electrical resistance of the first layer of titanium nitride does not significantly increase during subsequent thermal cycles.